

WHAT IS CLAIMED IS:

1. A rubber composition containing a filler comprising (a) 100 parts by weight of at least one rubber containing olefinic unsaturation, (b) 1 to 250 phr of a
5 filler, and (c) 0.05 to 5.0 phr of zinc oxide particles having a diameter of less than 20 nanometers.
2. The rubber composition according to claim 1, comprising 0.1 to 1.5 phr of zinc oxide particles having a diameter of less than 20 nanometers.
- 10 3. The rubber composition according to claim 1, comprising zinc oxide particles having a diameter of less than 12 nanometers.
4. The rubber composition according to claim 1, characterized in that said
15 filler comprises primary particles of silica particles having a diameter in a range of 5 to 25 nanometers which form at least partially clusters or aggregates having a diameter in a range of from 40 nanometers to 500 nanometers.
5. The rubber composition of claim 1 wherein said rubber containing
20 olefinic unsaturation is selected from the group consisting of natural rubber, neoprene, polyisoprene, butyl rubber, halobutyl rubber, polybutadiene, styrene-butadiene copolymer, styrene/isoprene/butadiene rubber, methyl methacrylate-butadiene copolymer, isoprene-styrene copolymer, methyl methacrylate-isoprene copolymer, acrylonitrile-isoprene copolymer, acrylonitrile-butadiene copolymer, EPDM, silicon-
25 coupled star-branched polymers, tin-coupled star-branched polymers and mixtures thereof.
6. The rubber composition according to claim 1, comprising at least one additional diene-based elastomer.
- 30 7. A sulfur-vulcanized rubber composition which is prepared by heating the composition of any of the claims 1 to 6 to a temperature ranging from 100°C to 200°C in the presence of a sulfur-vulcanizing agent.

8. An article of manufacture characterized by having at least one component comprised of the composition of any of the claims 1 to 7.

5 9. A tire characterized by having at least one component comprised of the composition of any of the claims 1 to 7.

10. A tire having a tread comprised of the composition of any of the claims 1 to 7.

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11. A method of processing a rubber composition containing a filler comprising mixing (a) 100 parts by weight of at least one rubber containing olefinic unsaturation with (b) a mixture comprising 1 to 250 phr of a filler and 0.05 to 5.0 phr of zinc oxide particles having a diameter of less than 20 nanometers.

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12. A method of processing a rubber composition containing a filler comprising mixing (a) 100 parts by weight of at least one rubber containing olefinic unsaturation, (b) 1 to 250 phr of a filler and (c) a mixture of 0.05 to 5.0 phr of zinc oxide particles having a diameter of less than 20 nanometers with a processing additive.

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13. A method of processing a rubber composition containing a filler comprising mixing (a) 100 parts by weight of at least one rubber containing olefinic unsaturation, (b) 1 to 250 phr of a filler and (c) a masterbatch comprising 0.05 to 5.0 phr of zinc oxide particles having a diameter of less than 20 nanometers and at least one polymer.

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14. The method according to claim 11, 12 or 13, characterized by using 0.1 to 1.5 phr of zinc oxide particles having a diameter of less than 20 nanometers.

30 15. The method of claim 11 wherein the processing additive comprises an oil, a wax, a fatty acid or a resin.

16. The method of claim 11, 12 or 13, wherein said rubber composition is thermomechanically mixed at a rubber temperature in a range of from 140°C to 190°C for a mixing time of from 1 to 20 minutes.